

(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号
特開2003-178733
(P2003-178733A)

(43)公開日 平成15年6月27日(2003.6.27)

(51)Int.Cl.⁷
H 0 1 M 2/10

識別記号

F I
H 0 1 M 2/10

データベース(参考)
M 5 H 0 4 0

審査請求 未請求 請求項の数1 O L (全 4 頁)

(21)出願番号 特願2001-374069(P2001-374069)

(22)出願日 平成13年12月7日(2001.12.7)

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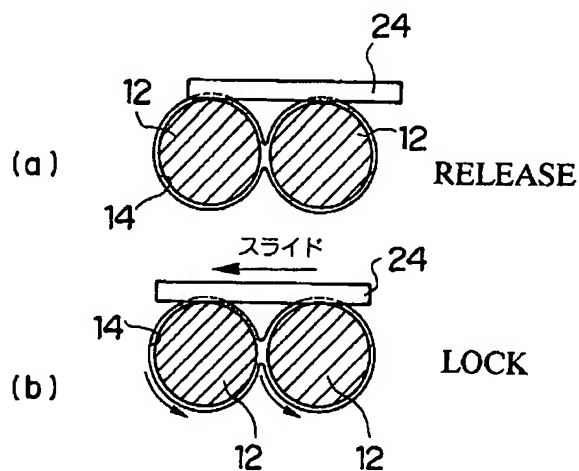
Fターム(参考) 5H040 AA19 AS15 AT01 AY02 AY12
CC03 CC11

(54)【発明の名称】 電池の接点構造

(57)【要約】

【課題】電池と電池接続用端子の間の接触抵抗を低い値で安定させ、カメラ本体や電池の個体差による電池寿命のバラツキを改善することができる電池の接点構造を提供する。

【解決手段】電池室14に対して電池12を長手方向から挿入するタイプの電池収納部において、接点圧の高い電池蓋の閉め動作に伴い電池と電池接続用端子とを相対的に移動させ、接触部同士の擦り合わせによるセルフクリーニング効果を高める。例えば、電池蓋の内側に設けたホルルド部材24を電池12の側面に接触させ、電池蓋をロックする際のスライド動作によって電池12を周方向に回転させることで、電池両端の端子と擦り合わせる。また、電池室14の奥行き端に配置される端子ベースと電池蓋とをリンク機構によって連結し、電池蓋のスライド動作に連動して端子ベースをスライドさせる構造も可能である。



能な電池室14を備えている。電池室14は挿入口14Aから電池12の長手方向に沿って奥行きのある空間部となっており、電池12は該電池室14に対して長手方向から挿入される。JISによれば単三形乾電池において $\phi 14 \pm 0.5$ mmの外寸法公差が定められているため、電池室14の内径は電池12の外径寸法公差を考慮して電池12の外径よりも僅かに大きく形成されており、電池挿入時には電池室14の内壁と電池12との間に適度なクリアランスが形成される。なお、本発明の実施に際して、電池12の形状及び本数は図1の例に限定されない。

【0015】電池蓋20は、電子機器の本体又は電池収納部11のユニットに回転自在かつスライド移動自在に取り付けられている。電池蓋20を矢印A方向にスライドさせることにより、蓋の係止機構（不図示）をロック又は解除できる。

【0016】電池蓋20の内側には、電池接続用端子22が設けられるとともに、電池12をホールドするためのホールド部材24が設けられている。なお、図1には示さないが、電池室14の奥行き端にも電池接続用端子（図4中符号30として記載）が設けられている。電池室14に遊挿された電池12は、電池室14の内壁とのクリアランス分だけ電池室14内で移動可能であるとともに、周方向に回転することが可能である。

【0017】両端の電池接続用端子22、30のうち少なくとも一方の端子は、図示せぬバネ構造を有しており、電池蓋20をロックすると、電池12の各電極がそれぞれ電池接続用端子22、30に接触し、電池12は前記バネ構造の力によって長手方向に付勢され、端子間に挟まれた状態で保持される。

【0018】図2はホールド部材24を有する電池蓋20の斜視図である。ホールド部材24はゴム等の弾性部材で構成されており、図2に示すように、電池蓋20を閉じるとホールド部材24は電池12の側面と接触し、電池蓋20のスライドに伴い電池12を回転させる力を電池12に与える。

【0019】次に、上記の如く構成された電池の接点構造の作用を説明する。

【0020】図3はホールド部材24の作用を示す説明図である。図3(a)は電池蓋20がロックされていない状態（ロック解除状態）を示し、図3(b)は電池蓋20がロックされた状態（ロック状態）を示す。図3(a)の状態から電池蓋20を図の左方向にスライドさせると、図3(b)に示すように、電池12はホールド部材24との摩擦力によって電池室14内で回転する。

【0021】図4(a)は、電池12の電極26と電池接続用端子22の接触位置Pの関係を示す平面図であり、図4(b)は電池室14内に装填された電池12の側面図である。これらの図面に示したように、電池接続用端子22の接点部（突起部）28は電池12の長手方

向の中心軸Cからずれた位置に当接する構造（オフセンター構造）になっている。電池室14の奥行き端に設けられている電池接続用端子30についても同様に、その接点部（突起部）32は電池12の中心軸Cからずれた位置に当接する構造になっている。

【0022】したがって、電池蓋20のロック動作に伴って電池12が中心軸Cを中心に回転すると、電池12の両端の電極と電池接続用端子22、30とが同時に擦り合わされる。図4(a)には、電池12の回転によって接触位置Pが相対的に移動する様子が矢印Bによって示されている。こうして、電池12と電池接続用端子22、30との接触部同士の擦り合わせにより、接触面の異物（酸化皮膜や手油など）等を除去することができ、電池12と端子との接触抵抗を低い値で安定させることが可能となる。

【0023】次に、本発明の他の実施形態について説明する。

【0024】図5は本発明の他の実施形態に係る電池の接点構造を示す図である。図5中図1に示した例と同一又は類似の部分には同一の符号を付し、その説明は省略する。図5(a)は電池蓋20がロックされていない状態を示し、図5(b)は電池蓋20がロックされた状態を示す。

【0025】これらの図面に示したように、電池室14の奥行き端に配置されている端子ベース40には電池接続用端子42が設けられている。端子ベース40はリンク機構46によって電池蓋20と連結され、図5上で上方向に移動自在である。

【0026】かかる構造によれば、電池蓋20を図5上で上方向にスライドさせて蓋をロックする操作を行うと、この動きがリンク機構46を介して端子ベース40に伝達され、端子ベース40は図5の下方にスライドする。こうして、電池蓋20及び端子ベース40がそれぞれ移動することにより、電池12の両端の電極が電池接続用端子22、42と擦れ合い、セルフクリーニング効果が得られる。

【0027】なお、リンク機構46の支点48の位置はリンク棒50の中央に限定されず、電池蓋20の移動量と端子ベース40の移動量の関係並びに電池蓋20の操作荷重等を考慮して、適切な位置に設計される。

【0028】

【発明の効果】以上説明したように本発明によれば、電池収納室に対して電池を長手方向から挿入するタイプの電池収納部において、電池蓋の閉め動作に連動させて電池と電池接続用端子とを相対的に移動させ、接触部同士を擦り合わせる構造にしたので、接点部分のセルフクリーニング効果を高めることができ、接触抵抗を低い値で安定させることができる。これにより、電池を使用する機器本体や電池の個体差による電池寿命のバラツキを改善することができる。

【図面の簡単な説明】

【図1】 本発明の実施形態に係る電池の接点構造を示す斜視図

【図2】 ホールド部材を有する電池蓋の斜視図

【図3】 ホールド部材の作用を示す説明図

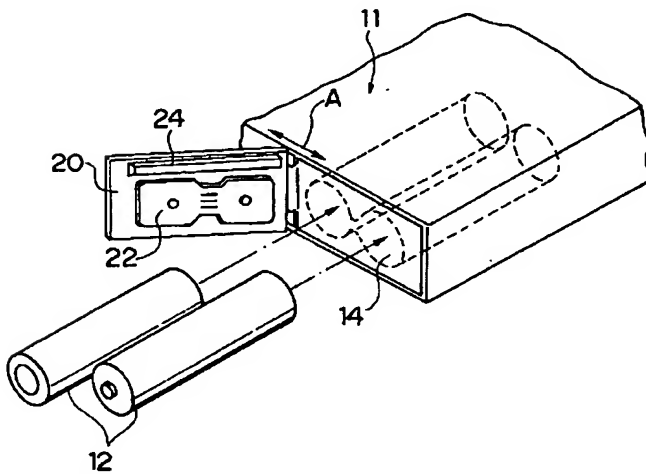
【図4】 電池の電極と電池接続用端子の接触位置の関係を示す図であり、図4(a)は電池の平面図、図4(b)は電池の側面図

【図5】 本発明の他の実施形態に係る電池の接点構造を示す図

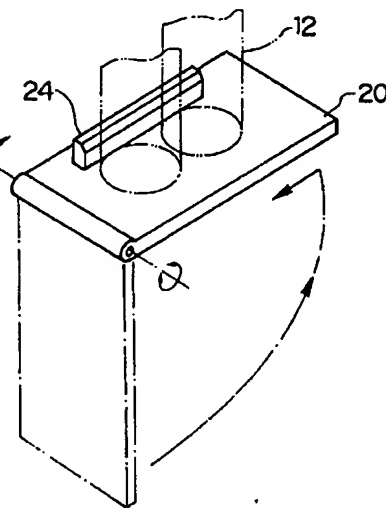
【符号の説明】

11…電池収納部、12…電池、14…電池室、20…電池蓋、22、30…電池接続用端子、24…ホールド部材、40…端子ベース、42…電池接続用端子、46…リンク機構、48…支点、50…リンク棒

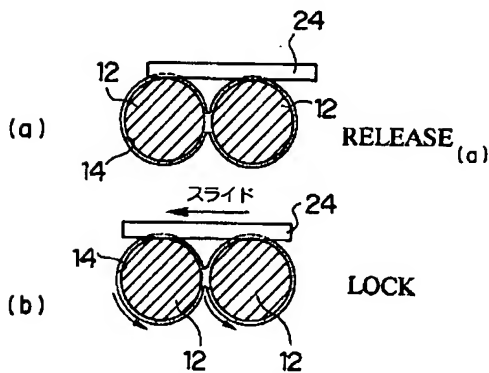
【図1】



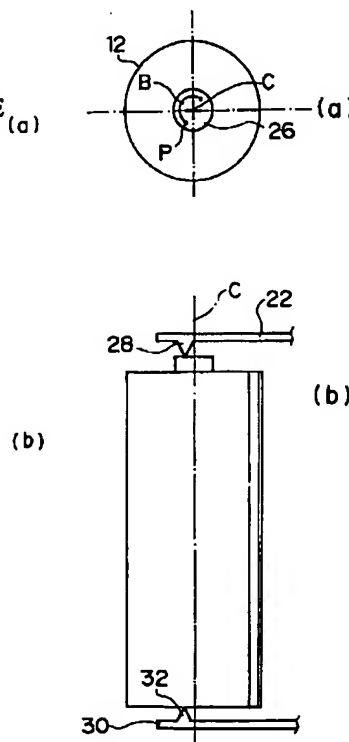
【図2】



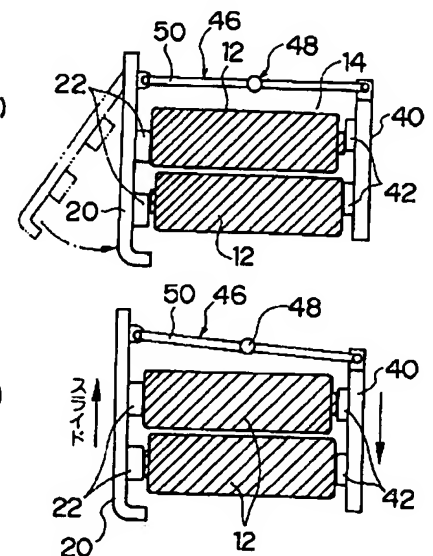
【図3】



【図4】



【図5】



PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2003-178733

(43)Date of publication of application : 27.06.2003

(51)Int.Cl.

H01M 2/10

(21)Application number : 2001-374069 (71)Applicant : FUJI PHOTO FILM CO LTD

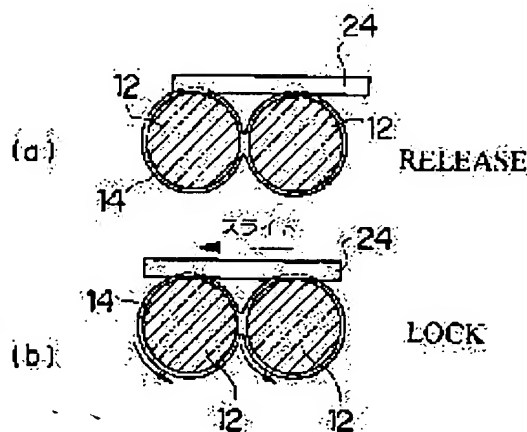
(22)Date of filing : 07.12.2001 (72)Inventor : SUZUKI SHINJI

(54) CONTACT STRUCTURE OF BATTERY

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a contact structure of a battery capable of improving fluctuation of battery life due to the individual difference of camera body and batteries by making the contact resistance between the battery and a battery connection terminal low.

SOLUTION: For a battery housing part into which, batteries 12 are inserted along the longitudinal direction of a battery chamber 14, self-cleaning effect between the battery and the battery connection terminals is heightened by closing a battery lid having high contact point pressure which makes the battery and the battery connection terminals relatively move and makes the contacts scrub each other. For example, the battery and the connection terminals at both end sides of the battery are scrubbed each other by making the holding member 24 formed to the inside of the battery lid contact with the side surface of the battery 12, and making the battery rotate in the peripheral direction. It is possible to form into a structure which makes the terminal base slide, interlocking with the slide movement of the battery lid, by jointing the terminal base arranged at the back end of the battery chamber 14 with the terminal base by a linking structure.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] The cell receipt room which can insert a cell along with the longitudinal direction of a cell, The terminal for cell connection prepared, respectively inside the cell lid for opening and closing insertion opening of said cell receipt room, and the depth edge of said cell receipt room and said cell lid, Contact structure of the cell characterized by having a sliding means to realize actuation which is made to move relatively said cell and said terminal for cell connection with closed actuation of said cell lid, and adjusts both contact sections each other.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the structure of the contact for cell connection in the battery holder which is built over the contact structure of a cell, especially is applied to electronic equipment, such as a camera.

[0002]

[Description of the Prior Art] In recent years, a miniaturization progresses, and the digital camera has become an important factor after that a miniaturization and number reduction of cells commercialize. On the other hand, the commercial-scene request to a battery life is strong, and power-saving and reduction of contact resistance have been an indispensable technical problem on product development.

[0003]

[Problem(s) to be Solved by the Invention] Conventionally, when a new cell was used in the digital camera which uses an alkaline battery, even if it was the digital camera of this model, variation had occurred in the number of sheets which can be photoed. As this cause, the variation in the contact resistance between the electrode of a cell and the terminal for cell connection can be considered. That is, if the contact surface of a cell or the terminal for cell connection carries out long duration neglect, an oxide film will be formed in a front face and contact resistance will become large. Moreover, also when foreign matters, such as ****, adhere to a terminal front face, there is a problem that contact resistance becomes large.

[0004] In the case of the camera which inserts a cell in a longitudinal direction, the cell lid side could carry out self-cleaning by sliding, but the terminal by the side of the back had the fault that self-cleaning could not be carried out.

[0005] This invention was made in view of such a situation, and stabilizes the contact resistance between the cells and the terminals for cell connection which are one factor which prolongs a battery life in a low value, and it aims at offering the contact structure of the cell which can improve the variation in the battery life by the body of a camera, or the individual difference of a cell.

[0006]

[Means for Solving the Problem] The contact structure of the cell built over invention according to claim 1 in order to attain said purpose The cell receipt room which can insert a cell along with the longitudinal direction of a cell, The terminal for cell connection prepared, respectively inside the cell lid for opening and closing insertion opening of said cell receipt room, and the depth edge of said cell receipt room and said cell lid, It is characterized by having a sliding means to realize actuation which is made to move relatively said cell and said terminal for cell connection with closed actuation of said cell lid, and adjusts both contact sections each other.

[0007] That is, this invention is applied to the battery holder of the type inserted and loaded with a cell from a longitudinal direction to the cell receipt room which has the depth space in alignment

with the longitudinal direction of a cell. If a cell is inserted in a cell receipt room and a cell lid is closed, the electrode of cell both ends contacts the terminal for cell connection, respectively, and a cell will be electrically connected with the electrical circuit in electronic equipment while being inserted and fixed between terminals. Since this invention has the structure where a motion of a cell lid is interlocked with at the time of closed actuation of the high cell lid of contact pressure, and a sliding means adjusts the contact sections of a cell and the terminal for cell connection each other, foreign matters, such as an oxide film on the front face of a contact surface, are removable at the time of cell loading. Thereby, without a user being conscious, the self-cleaning effectiveness can be heightened and a battery life can be secured.

[0008] Moreover, invention (1) shown below and (2) are offered as a concrete mode of this invention.

[0009] Invention (1): Said cell lid is the contact structure of the cell according to claim 1 characterized by having the structure which cancels [a lock or] a lid, preparing the hold member which contacts the peripheral surface of said cell in said cell lid as said sliding means, and said hold member making a hoop direction rotate said cell with slide actuation of the cell lid concerned by making it slide in the predetermined direction.

[0010] In this case, as for said hold section, it is desirable to use elastic members, such as fricative large (for the hold nature of a cell to be good) rubber. Moreover, the contact section (height) of the terminal for cell connection is formed so that the location [medial axis / of the longitudinal direction of said cell] (off-center location [mid gear / of the polar zone of a cell] shifted) shifted may be contacted. By this configuration, if a cell rotates, the contact location of a cell electrode will move to the contact section of the terminal for cell connection, and the self-cleaning effectiveness by adjustment is acquired.

[0011] Invention (2): The terminal for cell connection prepared in the depth edge of said cell receipt room is the contact structure of the cell according to claim 1 which is interlocked with a motion of said cell lid, is attached in movable terminal supporter material, and is characterized by having the linkage which transmits a motion of said cell lid to said terminal supporter material as said sliding means.

[0012] According to this mode, by actuation which closes a cell lid after cell insertion, since the electrode of the both ends of a cell rubs against the terminal for cell connection, respectively, the self-cleaning effectiveness for a contact surface is acquired.

[0013]

[Embodiment of the Invention] The gestalt of desirable operation of the contact structure of the cell built over this invention according to an accompanying drawing below is explained.

[0014] Drawing 1 is the perspective view showing the contact structure of the cell concerning the operation gestalt of this invention. the battery holder 11 shown in this drawing -- two AA -- the form cells 12 and 12 were arranged horizontally and it has the battery compartment 14 which can be held. The battery compartment 14 serves as the space section which has depth along with the longitudinal direction of a cell 12 from insertion opening 14A, and a cell 12 is inserted from a longitudinal direction to this battery compartment 14. according to JIS -- AA -- since $\phi 14^{**}0.5\text{mm}$ dimension tolerance is defined in the form dry cell, the bore of a battery compartment 14 is slightly formed greatly rather than the outer diameter of a cell 12 in consideration of the outer-diameter dimensional tolerance of a cell 12, and moderate path clearance is formed between the wall of a battery compartment 14, and a cell 12 at the time of cell insertion. In addition, on the occasion of operation of this invention, the configuration and number of a cell 12 are not limited to the example of drawing 1.

[0015] The cell lid 20 is attached in the body of electronic equipment, or the unit of a battery holder 11 free [rotation] and free [slide migration]. The stop device (un-illustrating) of a lid can be locked or canceled by making the cell lid 20 slide in the direction of arrow-head A.

[0016] Inside the cell lid 20, while the terminal 22 for cell connection is formed, the hold member 24 for holding a cell 12 is formed. In addition, although not shown in drawing 1, the terminal for cell connection (it indicates as a sign 30 in drawing 4) is prepared also in the depth edge of a battery compartment 14. The cell 12 loosely inserted in the battery compartment 14 can be rotated to a hoop direction while it is movable in a battery compartment 14 by path clearance with the wall of a battery compartment 14.

[0017] If one [at least] terminal has the spring structure which is not illustrated and locks the cell lid 20 among the terminals 22 and 30 for cell connection of both ends, each electrode of a cell 12 contacts the terminals 22 and 30 for cell connection, respectively, and a cell 12 will be energized by the force of said spring structure at a longitudinal direction, and will be held in the condition of having been inserted between terminals.

[0018] Drawing 2 is a perspective view of the cell lid 20 which has the hold member 24. If the cell lid 20 is closed as the hold member 24 consists of elastic members, such as rubber, and is shown in drawing 2, the hold member 24 will contact the side face of a cell 12, and will give the force of rotating a cell 12 with the slide of the cell lid 20 to a cell 12.

[0019] Next, an operation of the contact structure of the constituted cell is explained like the above.

[0020] Drawing 3 is the explanatory view showing an operation of the hold member 24. Drawing 3 (a) shows the condition (lock discharge condition) that the cell lid 20 is not locked, and drawing 3 (b) shows the condition (lock condition) that the cell lid 20 was locked. If the cell lid 20 is made to slide leftward [of drawing] from the condition of drawing 3 (a), as shown in drawing 3 (b), a cell 12 will rotate in a battery compartment 14 according to frictional force with the hold member 24.

[0021] Drawing 4 (a) is the top view showing the electrode 26 of a cell 12, and the relation of the contact location P of the terminal 22 for cell connection, and drawing 4 (b) is the side elevation of the cell 12 with which it was loaded into the battery compartment 14. As shown in these drawings, the contact surface (height) 28 of the terminal 22 for cell connection has structure (off-center structure) which contacts the location [medial axis / C / of the longitudinal direction of a cell 12] shifted. The contact surface (height) 32 has similarly structure which contacts the location [medial axis / C / of a cell 12] shifted about the terminal 30 for cell connection prepared in the depth edge of a battery compartment 14.

[0022] Therefore, if a cell 12 rotates focusing on a medial axis C with lock actuation of the cell lid 20, the electrode of the both ends of a cell 12 and the terminals 22 and 30 for cell connection will be ground against coincidence. Signs that the contact location P moves relatively by rotation of a cell 12 are shown to drawing 4 (a) by the arrow head B. In this way, the foreign matters (an oxide film, ****, etc.) of the contact surface etc. can be removed, and adjustment of the contact sections of a cell 12 and the terminals 22 and 30 for cell connection enables it to stabilize the contact resistance of a cell 12 and a terminal in a low value.

[0023] Next, other operation gestalten of this invention are explained.

[0024] Drawing 5 is drawing showing the contact structure of the cell concerning other operation gestalten of this invention. The same sign is given to a part the same as that of the example shown in drawing 1 in drawing 5, or similar, and the explanation is omitted. Drawing 5 (a) shows the condition that the cell lid 20 is not locked, and drawing 5 (b) shows the condition that the cell lid 20 was locked.

[0025] As shown in these drawings, the terminal 42 for cell connection is formed in the terminal base 40 arranged at the depth edge of a battery compartment 14. The terminal base 40 is connected with the cell lid 20 by the link mechanism 46, and is upward movable freely on drawing 5 with a link mechanism.

[0026] If actuation which is made to slide the cell lid 20 upward on drawing 5, and locks a lid is performed according to this structure, this motion will be transmitted to the terminal base 40 through a link mechanism 46, and the terminal base 40 will be slid under drawing 5. In this way, when the

cell lid 20 and the terminal base 40 move, respectively, the electrode of the both ends of a cell 12 rubs against the terminals 22 and 42 for cell connection, and the self-cleaning effectiveness is acquired.

[0027] In addition, the location of the supporting point 48 of a link mechanism 46 is not limited in the center of the link rod 50, but is designed by the related list of the movement magnitude of the cell lid 20, and the movement magnitude of the terminal base 40 in consideration of the operating load of the cell lid 20 etc. in a suitable location.

[0028]

[Effect of the Invention] Since it was made the structure of a cell lid shutting, having made it actuation interlocked with in the battery holder of the type which inserts a cell from a longitudinal direction to a cell receipt room, having moved a cell and the terminal for cell connection relatively, and adjusting the contact sections each other according to this invention as explained above, the self-cleaning effectiveness for a contact surface can be heightened, and contact resistance can be stabilized in a low value. Thereby, the variation in the battery life by the body of a device which uses a cell, or the individual difference of a cell is improvable.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the structure of the contact for cell connection in the battery holder which is built over the contact structure of a cell, especially is applied to electronic equipment, such as a camera.

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PRIOR ART

[Description of the Prior Art] In recent years, a miniaturization progresses, and the digital camera has become an important factor after that a miniaturization and number reduction of cells commercialize. On the other hand, the commercial-scene request to a battery life is strong, and power-saving and reduction of contact resistance have been an indispensable technical problem on product development.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] Since it was made the structure of a cell lid shutting, having made it actuation interlocked with in the battery holder of the type which inserts a cell from a longitudinal direction to a cell receipt room, having moved a cell and the terminal for cell connection relatively, and adjusting the contact sections each other according to this invention as explained above, the self-cleaning effectiveness for a contact surface can be heightened, and contact resistance can be stabilized in a low value. Thereby, the variation in the battery life by the body of a device which uses a cell, or the individual difference of a cell is improvable.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Conventionally, when a new cell was used in the digital camera which uses an alkaline battery, even if it was the digital camera of this model, variation had occurred in the number of sheets which can be photoed. As this cause, the variation in the contact resistance between the electrode of a cell and the terminal for cell connection can be considered. That is, if the contact surface of a cell or the terminal for cell connection carries out long duration neglect, an oxide film will be formed in a front face and contact resistance will become large. Moreover, also when foreign matters, such as ****, adhere to a terminal front face, there is a problem that contact resistance becomes large.

[0004] In the case of the camera which inserts a cell in a longitudinal direction, the cell lid side could carry out self-cleaning by sliding, but the terminal by the side of the back had the fault that self-cleaning could not be carried out.

[0005] This invention was made in view of such a situation, and stabilizes the contact resistance between the cells and the terminals for cell connection which are one factor which prolongs a battery life in a low value, and it aims at offering the contact structure of the cell which can improve the variation in the battery life by the body of a camera, or the individual difference of a cell.

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MEANS

[Means for Solving the Problem] The contact structure of the cell built over invention according to claim 1 in order to attain said purpose The cell receipt room which can insert a cell along with the longitudinal direction of a cell, The terminal for cell connection prepared, respectively inside the cell lid for opening and closing insertion opening of said cell receipt room, and the depth edge of said cell receipt room and said cell lid, It is characterized by having a sliding means to realize actuation which is made to move relatively said cell and said terminal for cell connection with closed actuation of said cell lid, and adjusts both contact sections each other.

[0007] That is, this invention is applied to the battery holder of the type inserted and loaded with a cell from a longitudinal direction to the cell receipt room which has the depth space in alignment with the longitudinal direction of a cell. If a cell is inserted in a cell receipt room and a cell lid is closed, the electrode of cell both ends contacts the terminal for cell connection, respectively, and a cell will be electrically connected with the electrical circuit in electronic equipment while being inserted and fixed between terminals. Since this invention has the structure where a motion of a cell lid is interlocked with at the time of closed actuation of the high cell lid of contact pressure, and a sliding means adjusts the contact sections of a cell and the terminal for cell connection each other, foreign matters, such as an oxide film on the front face of a contact surface, are removable at the time of cell loading. Thereby, without a user being conscious, the self-cleaning effectiveness can be heightened and a battery life can be secured.

[0008] Moreover, invention (1) shown below and (2) are offered as a concrete mode of this invention.

[0009] Invention (1): Said cell lid is the contact structure of the cell according to claim 1 characterized by having the structure which cancels [a lock or] a lid, preparing the hold member which contacts the peripheral surface of said cell in said cell lid as said sliding means, and said hold member making a hoop direction rotate said cell with slide actuation of the cell lid concerned by making it slide in the predetermined direction.

[0010] In this case, as for said hold section, it is desirable to use elastic members, such as fricative large (for the hold nature of a cell to be good) rubber. Moreover, the contact section (height) of the terminal for cell connection is formed so that the location [medial axis / of the longitudinal direction of said cell] (off-center location [mid gear / of the polar zone of a cell] shifted) shifted may be contacted. By this configuration, if a cell rotates, the contact location of a cell electrode will move to the contact section of the terminal for cell connection, and the self-cleaning effectiveness by adjustment is acquired.

[0011] Invention (2): The terminal for cell connection prepared in the depth edge of said cell receipt room is the contact structure of the cell according to claim 1 which is interlocked with a motion of said cell lid, is attached in movable terminal supporter material, and is characterized by having the linkage which transmits a motion of said cell lid to said terminal supporter material as said sliding means.

[0012] According to this mode, by actuation which closes a cell lid after cell insertion, since the electrode of the both ends of a cell rubs against the terminal for cell connection, respectively, the self-cleaning effectiveness for a contact surface is acquired.

[0013]

[Embodiment of the Invention] The gestalt of desirable operation of the contact structure of the cell built over this invention according to an accompanying drawing below is explained.

[0014] Drawing 1 is the perspective view showing the contact structure of the cell concerning the operation gestalt of this invention. the battery holder 11 shown in this drawing -- two AA -- the form cells 12 and 12 were arranged horizontally and it has the battery compartment 14 which can be held. The battery compartment 14 serves as the space section which has depth along with the longitudinal direction of a cell 12 from insertion opening 14A, and a cell 12 is inserted from a longitudinal direction to this battery compartment 14. according to JIS -- AA -- since $\phi 14^{+0.5}_{-0.5}$ mm dimension tolerance is defined in the form dry cell, the bore of a battery compartment 14 is slightly formed greatly rather than the outer diameter of a cell 12 in consideration of the outer-diameter dimensional tolerance of a cell 12, and moderate path clearance is formed between the wall of a battery compartment 14, and a cell 12 at the time of cell insertion. In addition, on the occasion of operation of this invention, the configuration and number of a cell 12 are not limited to the example of drawing 1.

[0015] The cell lid 20 is attached in the body of electronic equipment, or the unit of a battery holder 11 free [rotation] and free [slide migration]. The stop device (un-illustrating) of a lid can be locked or canceled by making the cell lid 20 slide in the direction of arrow-head A.

[0016] Inside the cell lid 20, while the terminal 22 for cell connection is formed, the hold member 24 for holding a cell 12 is formed. In addition, although not shown in drawing 1, the terminal for cell connection (it indicates as a sign 30 in drawing 4) is prepared also in the depth edge of a battery compartment 14. The cell 12 loosely inserted in the battery compartment 14 can be rotated to a hoop direction while it is movable in a battery compartment 14 by path clearance with the wall of a battery compartment 14.

[0017] If one [at least] terminal has the spring structure which is not illustrated and locks the cell lid 20 among the terminals 22 and 30 for cell connection of both ends, each electrode of a cell 12 contacts the terminals 22 and 30 for cell connection, respectively, and a cell 12 will be energized by the force of said spring structure at a longitudinal direction, and will be held in the condition of having been inserted between terminals.

[0018] Drawing 2 is a perspective view of the cell lid 20 which has the hold member 24. If the cell lid 20 is closed as the hold member 24 consists of elastic members, such as rubber, and is shown in drawing 2, the hold member 24 will contact the side face of a cell 12, and will give the force of rotating a cell 12 with the slide of the cell lid 20 to a cell 12.

[0019] Next, an operation of the contact structure of the constituted cell is explained like the above.

[0020] Drawing 3 is the explanatory view showing an operation of the hold member 24. Drawing 3 (a) shows the condition (lock discharge condition) that the cell lid 20 is not locked, and drawing 3 (b) shows the condition (lock condition) that the cell lid 20 was locked. If the cell lid 20 is made to slide leftward [of drawing] from the condition of drawing 3 (a), as shown in drawing 3 (b), a cell 12 will rotate in a battery compartment 14 according to frictional force with the hold member 24.

[0021] Drawing 4 (a) is the top view showing the electrode 26 of a cell 12, and the relation of the contact location P of the terminal 22 for cell connection, and drawing 4 (b) is the side elevation of the cell 12 with which it was loaded into the battery compartment 14. As shown in these drawings, the contact surface (height) 28 of the terminal 22 for cell connection has structure (off-center structure) which contacts the location [medial axis / C / of the longitudinal direction of a cell 12] shifted. The contact surface (height) 32 has similarly structure which contacts the location [medial axis / C / of a cell 12] shifted about the terminal 30 for cell connection prepared in the depth edge of

a battery compartment 14.

[0022] Therefore, if a cell 12 rotates focusing on a medial axis C with lock actuation of the cell lid 20, the electrode of the both ends of a cell 12 and the terminals 22 and 30 for cell connection will be ground against coincidence. Signs that the contact location P moves relatively by rotation of a cell 12 are shown to drawing 4 (a) by the arrow head B. In this way, the foreign matters (an oxide film, ****, etc.) of the contact surface etc. can be removed, and adjustment of the contact sections of a cell 12 and the terminals 22 and 30 for cell connection enables it to stabilize the contact resistance of a cell 12 and a terminal in a low value.

[0023] Next, other operation gestalten of this invention are explained.

[0024] Drawing 5 is drawing showing the contact structure of the cell concerning other operation gestalten of this invention. The same sign is given to a part the same as that of the example shown in drawing 1 in drawing 5, or similar, and the explanation is omitted. Drawing 5 (a) shows the condition that the cell lid 20 is not locked, and drawing 5 (b) shows the condition that the cell lid 20 was locked.

[0025] As shown in these drawings, the terminal 42 for cell connection is formed in the terminal base 40 arranged at the depth edge of a battery compartment 14. The terminal base 40 is connected with the cell lid 20 by the link mechanism 46, and is upward movable freely on drawing 5 with a link mechanism.

[0026] If actuation which is made to slide the cell lid 20 upward on drawing 5, and locks a lid is performed according to this structure, this motion will be transmitted to the terminal base 40 through a link mechanism 46, and the terminal base 40 will be slid under drawing 5. In this way, when the cell lid 20 and the terminal base 40 move, respectively, the electrode of the both ends of a cell 12 rubs against the terminals 22 and 42 for cell connection, and the self-cleaning effectiveness is acquired.

[0027] In addition, the location of the supporting point 48 of a link mechanism 46 is not limited in the center of the link rod 50, but is designed by the related list of the movement magnitude of the cell lid 20, and the movement magnitude of the terminal base 40 in consideration of the operating load of the cell lid 20 etc. in a suitable location.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The perspective view showing the contact structure of the cell concerning the operation gestalt of this invention

[Drawing 2] The perspective view of a cell lid which has a hold member

[Drawing 3] The explanatory view showing an operation of a hold member

[Drawing 4] It is drawing showing the electrode of a cell, and the relation of the contact location of the terminal for cell connection, and for drawing 4 (a), it is the top view of a cell and drawing 4 (b) is the side elevation of a cell.

[Drawing 5] Drawing showing the contact structure of the cell concerning other operation gestalten of this invention

[Description of Notations]

11 [-- 22 A cell lid 30 / -- The terminal for cell connection, 24 / -- A hold member, 40 / -- The terminal base, 42 / -- The terminal for cell connection, 46 / -- A link mechanism, 48 / -- The supporting point, 50 / -- Link rod] -- A battery holder, 12 -- A cell, 14 -- A battery compartment, 20

[Translation done.]

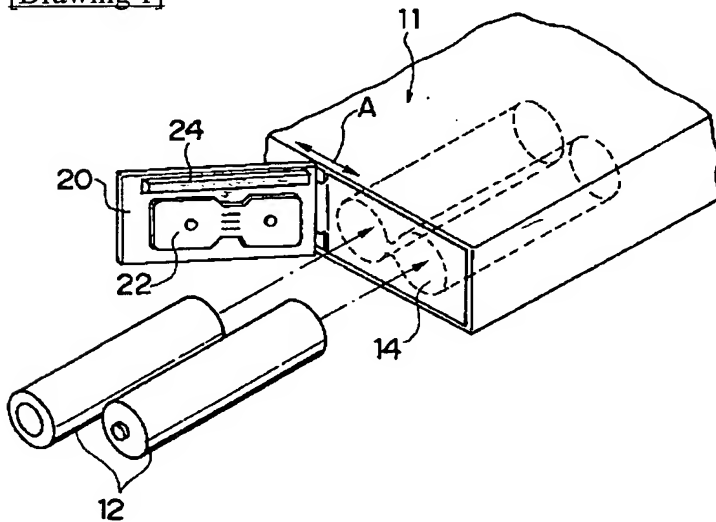
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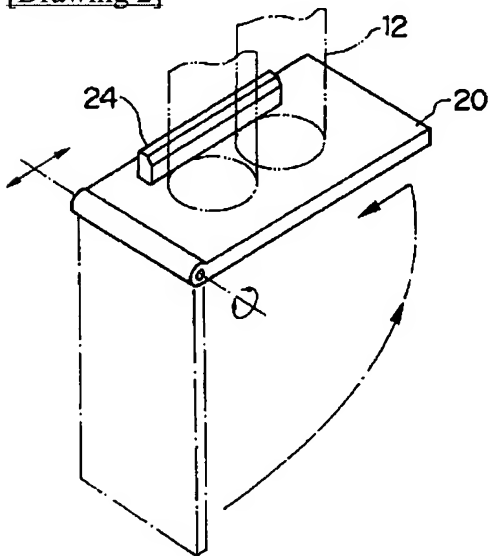
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DRAWINGS

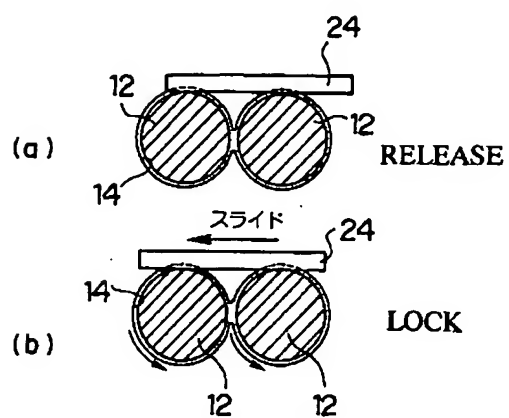
[Drawing 1]



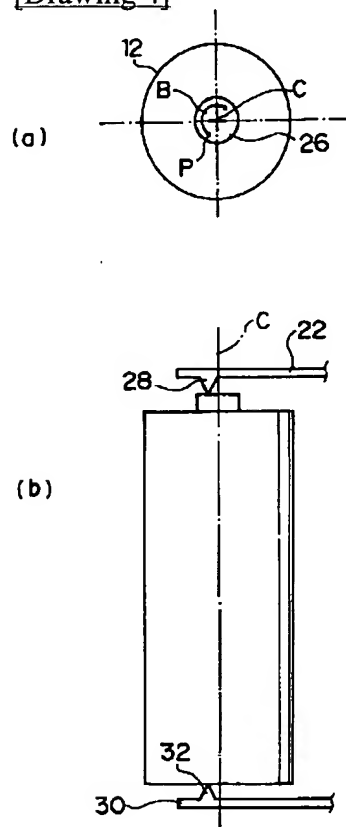
[Drawing 2]



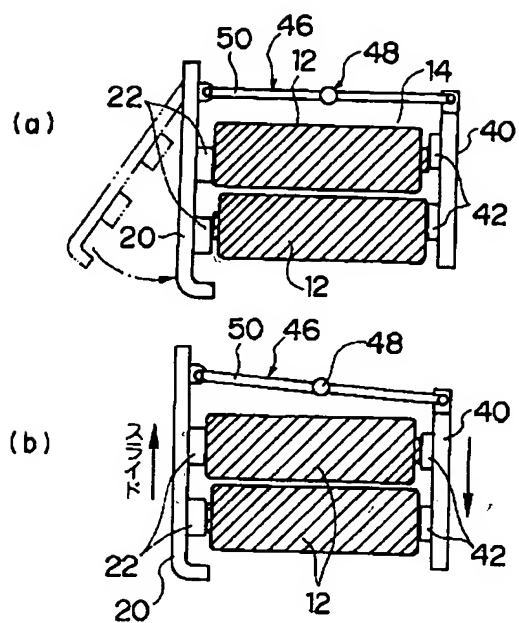
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Translation done.]